Evaluation of Position Description

Labor Category/FLSA: Nonexempt

_____**Current Position Description**
__X__**Proposed Position Description**

Date Prepared: 06/25/03

Approving Official: **Name:** Carolyn C. London **Signature:** Carolyn C London
Title: HR Specialist

Position Title/Series/Grade: Mechanical Engineer, GS-0830-07
ORGANIZATION: Division of Property Management, NIEHS

SEE THE EVALUATION STATEMENT THAT WAS ATTACHED TO THE PD. Position is developmental with a target grade of GS-0830-12.

Installation:	National Institute of Environmental Health Sciences, National Institutes of Health, Research Triangle Park, NC
Title:	Mechanical Engineer
Occ Series:	830
Pay Plan:	GS
Grade:	07

Introductory Statement: The Division of Property Management (DPM) serves all of the NIH Community by providing support for renovations, new construction and maintenance of existing facilities, utilities and grounds. The Division provides professional leadership for the engineering programs of the National Institutes of Health (NIH). The scope of DPM operations is such that the effectiveness with which they are carried out has a major and direct effect on the worldwide biomedical research programs of the NIH. In addition to the main facilities at the Bethesda Campus and in Poolesville, MD, NIH has facilities at Research Triangle Park, North Carolina, Rocky Mountain Laboratory in Montana and the Gerontology Research Center in Baltimore, MD. This position is organizationally and physically located within the DPM organizational subcomponent responsible for the provision of real property management services for the NIEHS facilities in Research Triangle Park, NC.

Statement of Differences
GS-830-07 v. GS-830-12

Major Duties

Design 70%

Assists in the preparation of... ...limited in scope, complexity and importance...
Typical designs are of a short duration (less than six months) with anticipated construction costs up to the one half million dollars.
Refers extraordinary considerations to higher level engineering personnel or supervisor.
Assists the Project Engineer on multiple facilities design and/or evaluation projects.
Assists Project Engineers in conferences with clients...

Contract Administration 15%

Inspects project progress...
Identifies problems or conflicts for resolution and initiates correction. Refers only complex issues to senior level engineers
Typical projects are of a shorter construction (less than nine months) duration and involve construction costs up to the one quarter million dollar range.
Assists Project Engineers on larger projects.

Technical Guidance 15%

Provides limited mechanical engineering guidance, when requested, in connection with assigned projects.

KNOWLEDGE REQUIRED BY THE POSITION

Practical knowledge of mechanical engineering concepts, principles, and practices applicable to the full range of engineering duties concerned with the design and layout of mechanical systems. Ability to design mechanical systems such as could be acquired through a bachelor's degree program in mechanical engineering or similar professional field. Ability and skill to apply technical knowledge and principals to assignments in designing and planning difficult but well-precedented projects. Some familiarity with related engineering fields, such as electrical, structural and architectural.

SUPERVISORY CONTROLS

Supervisor provides continuing or individual assignments and instructions of work to be done in terms of limitations, quality, deadlines and priority of assignments. Supervisory instructions, including suggested work method or advice on source materials, are provided in those situations which are new, difficult, or unusual. The employee carries out recurring assignments independently without specific instructions, but refers unfamiliar situations to the supervisor for assistance. Completed work is reviewed for technical accuracy and compliance with instructions and established procedures.

GUIDELINES

Guidelines include the ASHRAE handbooks, ASME codes, technical literature, and manufacturers' data. The employee must use judgment in locating and selecting the most appropriate guidelines, references and procedures to specific work assignments. Work assignments in which existing guidelines cannot be applied or those which require significant deviations from the guidelines are referred to the supervisor or higher level engineer.

COMPLEXITY

The assignments consists or duties which involve different and unrelated mechanical systems and equipment found in the buildings. The employee must analyze and choose a course of action for the projects assigned. The work involves conditions and elements which must be identified and analyzed to solve engineering problems or to refer them to the appropriate source.

SCOPE AND EFFECT

The purpose of the work is to formulate and coordinate all mechanical engineering and certain other aspects of NIEHS facilities, and major repair and improvement projects, in order to meet long-range, urgent and unique requirements of research programs. Projects for which the employee makes decisions are most often valued up to the one half million dollar range. The work affects the efficiency, economy, accuracy, reliability, or acceptability of further processes of the systems and equipment, as well as Institute and other personnel.

PERSONAL CONTACTS

Contacts are with employees within the agency, peer groups, professional organizations. and contractor and manufacture representatives.

PURPOSE OF CONTACT

Contacts are to exchange information, coordinate work efforts, resolve issues, review drawings, specifications and cost estimates and require corrections as necessary. Contacts NIEHS administrative and research personnel to determine scopes of work and program and design needs. Contacts peer group personnel and professional organizations to solicit information on industry trends pertaining to safety or other design issues. Contacts other FEB engineers (e.g., electrical, architectural) to determine equipment maintenance needs and resolve design or construction problems.

MECHANICAL ENGINEER

GS-830-12

I. INTRODUCTION

The Facilities Engineering Branch (FEB) plans, directs, supervises, and coordinates all facilities engineering activities which include, but are not limited to: budget formulation; engineering design; facilities inspection, construction and master planning; space management and leasing; operation of utility plants and related systems; maintenance and repair of all real property (buildings, grounds, surfaced areas, utility plants and systems); fire prevention and protection; custodial and security services; refuse collection and disposal; design, fabrication, alteration and repair of scientific instrumentation; and, storage and supply of construction and maintenance materials.

This position is located in the Engineering Management Section (EMS) of the FEB. The EMS provides multi-disciplinary professional architectural and engineering services including planning, design, construction administration and lease management in support of the National Institute of Environmental Health Sciences' (NIEHS) research programs. Services include designing and constructing new facilities; improvements, alterations and major repairs to existing facilities; engineering studies using in-house resources and out-sourcing (A/E firms and private construction contractors), and leasing of off-site facilities.

II. MAJOR DUTIES AND RESPONSIBILITIES

Serves as mechanical engineering specialist in a multi-discipline section responsible for planning, directing, reviewing, and coordinating a wide range of mechanical engineering activities at the NIEHS. The employee's expertise covers modifications and/or development of systems such as central and building heating, air-conditioning, refrigeration, ventilation, and exhaust, master utility distribution systems, monitoring and control systems, water treatment systems, waste incineration, a wide range of plumbing systems, bio-hazard waste treatment, and large sprinkler systems for fire protection. These systems are provided for a large campus-type biomedical research facility containing laboratories, animal facilities, and support buildings such as offices, shops, warehouses, and central utilities plant.

Design (35%):

Prepares feasibility studies and analyses of program needs for projects that are extensive in scope, complexity and importance to reconcile project requirements with sound engineering considerations and with such other realities as building codes, standards, rules and regulations such as are found in biomedical research facilities and hospitals.

Prepares preliminary drawings and cost estimates which present the solution to the completed design criteria. Evaluates design objectives, performs complex technical calculations, identifies the most economical and efficient procedures for project design and performance,

considering all influences. On larger projects, Programs of Requirements are prepared and basic design and engineering features are established. The completed design criteria serves as the basis for contract A/E detailed design development and specifications.

Serves as Project Engineer on one or more concurrent facilities design and/or evaluation projects assigned by the supervisor who delineates project goals, time and budget limitations. Employee must develop and achieve the stated objectives within assigned time and budget limits.

For assigned projects, reviews the work of contract A/Es for adequacy and thoroughness of design solutions, details, and feasibility studies. Consults with A/E as necessary to provide instruction on resolution of design problems. Determines compliance with Statement of Work, Program of Requirements, design guidelines, good architectural and engineering practices, regulations, and other considerations such as life cycle cost analysis and energy conservation. Continually reviews the work of contract A/E firms to insure design excellence and that safety and mechanical space requirements are met. Reviews for quantities, adherence to cost and completion schedules, technical adequacy, conformity with contract requirements, and agreements between architectural and engineering elements, and specifications.

Conducts conferences with clients to explain the technical development of designs and obtain any review comments; coordinates the detailed technical review of the projects at required intervals with the other technical disciplines of the EMS and with other reviewing groups having responsibilities for operation and maintenance, safety, environmental health, housekeeping, etc. Assembles and coordinates all review comments, including his own, into a single comprehensive document to provide the designers with information needed to further develop the project. In preparing comprehensive review documents, obtains or recommends compromises in the design which may be brought about by budget limitations or technical conflicts.

Contract Administration (40%):

Assures that contractual requirements and program criteria are being met, and resolves problems or conflicts.

The incumbent participates in the selection of architect/engineer firms, develops criteria for selection of firms, and may serve as chairman of the official selection committee. For assigned projects, incumbent develops and is responsible for the special provisions of the A/E contract which states the working relationship between NIEHS and the A/E for the duration of the project. During the negotiations, the incumbent is responsible for refinement of the project scope and budget, taking into account the resources available with the Contracting Officer. Negotiates with the A/E the need for special consultants and services depending on the nature of the design process.

During construction incumbent is responsible for the technical and administrative execution of contract requirements. In his/her capacity consults with construction contractor personnel

to resolve difficult and complex unforeseen problems and latent conditions surfacing during construction, and based on the conditions, has sketches or change drawings or specifications prepared solving the problems and incorporates these change documents into the contract performance documents.

Reviews and evaluates shop drawings, samples and material certifications submitted by the contractor for contract and performance requirements, recommending approval, rejection, or needed corrections or transmits these materials to the A/E for review and approval where appropriate.

As a Project Officer for construction, ensures that a log is maintained that denotes work location, progress, number of construction personnel, site conditions, conflicts, and any other special situations that arise. Provides technical support to the Contracting Officer, Acquisition Management Branch (AMB) in the negotiation of contract modifications. Processes progress payment invoices. At the end of construction, obtains release of lien, approves final invoice and forwards completed package to the AMB. In response to contractor claims, performs technical evaluation of claims for use in Contracting Officer's Decision, provides technical support to the Office of General Counsel (OGC) in litigation of appeals, including serving as a witness.

Technical Guidance (25%):

Provides planning, technical guidance, advice and counsel in oral and written forms.

Consults with research personnel and other advisory groups such as the Health & Safety Branch in efforts to improve facilities and service at NIEHS.

Serves as mechanical engineering expert on discussions regarding controversial issues in connection with major assigned projects.

Prepares correspondence, technical reports, estimates, fact sheets, status reports and schedules as required to complete project assignments.

Furnishes expert technical advice to other NIEHS/FEB staff engineers, as well as engineers with other agencies (e.g., EPA, GSA and COE), as required.

Performs other duties as assigned.

6/24/03

FACTOR 1 - KNOWLEDGE REQUIRED BY THE POSITION Level 1-~~8~~ 7 1250 1550 points CCL

~~Mastery of advanced~~ Professional knowledge of concepts, principles, and practices of mechanical engineering that enable incumbent to ~~serve as an expert in the~~ apply full range of engineering environmental control systems for the NIEHS. Serves as a technical authority in the full range of mechanical engineering duties concerned with central control and monitoring systems, central utilities and their generation and distribution, and the design and layout of plumbing, heating, ventilating, air-conditioning, fire protection and other mechanical systems.

The employee possesses the ability to conduct master utility studies designed to provide data for long-term planning of central utility or building mechanical requirements for NIEHS and to recommend to management a schedule of the necessary additions and modifications to the existing mechanical systems so as to ensure sufficient capacities in these utilities for long-range building programs. These recommendations can involve the expenditure of many millions of dollars and can require planning five years and longer in advance of the expenditure of funds. The employee will have the ability to analyze the impact on systems created by additions or modifications and the ability to plan and coordinate the necessary system changes prior to implementation. The employee has expertise in evaluating completed drawings of components of mechanical utility generation and distribution systems, building heating, ventilating, air-conditioning, plumbing, fire protection and monitoring and control systems in a campus-type biomedical research facility. The employee will possess the knowledge and ability to apply new developments and/or experimental theories to problems not readily resolved by accepted methods. The incumbent can utilize this information in preparation of detailed plans and specifications for construction projects.

The employee must have general knowledge of related engineering disciplines such as electrical, civil, structural, and architectural.

FACTOR 2 - SUPERVISORY CONTROLS **Level 2-4 450 points**

Assignments of work are issued by Supervisor. Supervision is essentially administrative in nature with assignments made in the form of a designated project for which the scope must be developed, designed, and construction contract administered by the incumbent. The incumbent plans for and carries out projects with authority to act on own initiative on matters affecting the project's design. Master plans, deviation from agency policies, schedule changes, budget changes, and changes or actions that degrade the objective performance or alter operational characteristics of the project are submitted for final sign-off by the supervisor together with recommended courses of action, including available alternatives. The incumbent keeps the supervisor informed of progress, potentially controversial matters which he identifies by an ongoing project analysis, or issues with far-reaching implications. Otherwise, actions, decisions, and commitments are considered technically authoritative and are accepted without change. The supervisor, however, is available for consultation on policy matters. Incumbent must exercise judgment to determine priority of competing requirements when the priority is not defined by supervisor.

FACTOR 3 - GUIDELINES **Level 3-4 450 points**

Guidelines include ASHRAE handbooks, ASME codes, technical literature and manufacturers' data. These guides have limited applicability to many of the problems encountered. As a technical specialist, the employee must exercise judgment and creativity in deviating from traditional methods available; and must employ a versatile background in engineering theory and precedent in adapting and developing new methods as required. Serves as the resident expert and interpreter of a variety of local and national building codes and directives on mechanical engineering criteria for various types of buildings.

FACTOR 4 - COMPLEXITY — Level 4-5 — 325 points

Assignments involve a broad range of activities and highly specialized mechanical engineering functions. As a technical expert for NIEHS, the employee continually makes far-reaching engineering decisions regarding mechanical systems and equipment. The employee is frequently confronted with novel and obscure problems which require innovative modification of existing methods and creative development of new approaches. Reviews of major building designs performed by private architect/engineer firms must be performed within short time frames, so the employee must use experience and judgment to analyze complex systems quickly and concentrate review efforts on areas of greatest impact where significant costs or energy are involved or where poor design would cause serious disruption to planned research programs.

FACTOR 5 - SCOPE AND EFFECT — Level 5-5 — 325 points

The purpose of the work is to provide direction and expert technical advice to all major design projects planned for NIEHS. Projects for which the employee makes decisions are most often valued in the multimillion-dollar range. Reliability in performance of support systems in biomedical research facilities is of utmost importance; the employee must provide leadership in achieving this reliability. Work performed by the employee has significant impact on the important research efforts carried on by NIEHS and often sets the trend for future construction criteria.

FACTOR 6 - PERSONAL CONTACTS — Level 6-3 — 60 points

Contacts are with private architect/engineers, State and Local Government officials, engineers with other Government agencies and private firms, NIEHS administrative and research personnel, engineers and industrial hygienists, with other peer groups at NIEHS and NIH, other FEB engineers, and contractor and manufacturer's representatives.

FACTOR 7 - PURPOSE OF CONTACTS — Level 7-1 — 20 points

Contacts private architect/engineers to exchange information, coordinate work efforts, furnish technical advice, resolve controversial issues, review drawings, specifications and cost estimates and require corrections as necessary. Contacts engineers in other agencies and firms to coordinate and develop consistent policies and design approaches. Contacts NIEHS administrative and research personnel to determine scopes of work. Contacts peer group personnel and professional organizations to exchange information on industry trends pertaining to safety or other design issues . Contacts other FEB engineers (e.g., electrical, architectural) to determine equipment maintenance needs and to resolve design and construction problems. Confers with contractors to resolve field problems which conflict with design. Contacts manufacturer's representatives to obtain technical information on latest products.

FACTOR 8 - PHYSICAL DEMANDS — Level 8-1 — 5 points

The work is mainly sedentary, but site surveys and investigations of construction problems require climbing on ladders, and considerable bending, stooping, squeezing through tight places, etc. Occasionally a change to work clothes is required.

FACTOR 9 - WORK ENVIRONMENT **Level 9-1 5 points**

Work is performed primarily in an office setting, with some site visits to the laboratory and animals areas where bio-hazard exposure can occur; some visits to mechanical equipment rooms and power plants where exposure to noise, high voltage and moving parts is common, when making field inspections.

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Total Points ~~3190~~ 2890 **GS-1~~8~~ 7**